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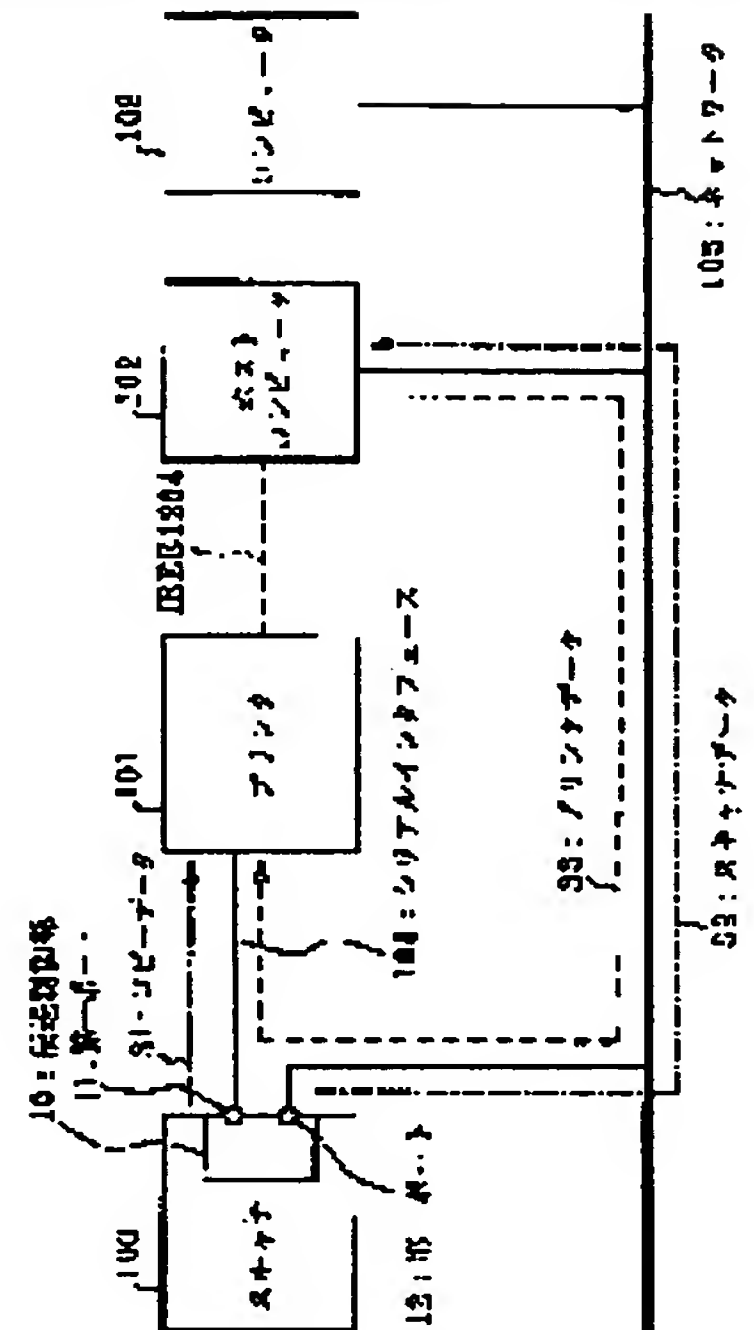
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## (54) IMAGE INPUT DEVICE AND IMAGE INFORMATION TRANSMISSION SYSTEM

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a technique for transferring image information to an image output device through a serial interface, without occupying the network connected to a host computer.

**SOLUTION:** The image input device is provided with a first port 11 for serial interface connected to a printer device 101, a second port 12 for serial interface connected to a host computer 102 via a network 105, and a transmission control part 10, which controls an input image interface connected to an image-processing means in the image input device and the state of transmission between the first and second ports 11 and 12, and thus the image input device has a constitution incorporating a switching hub function.



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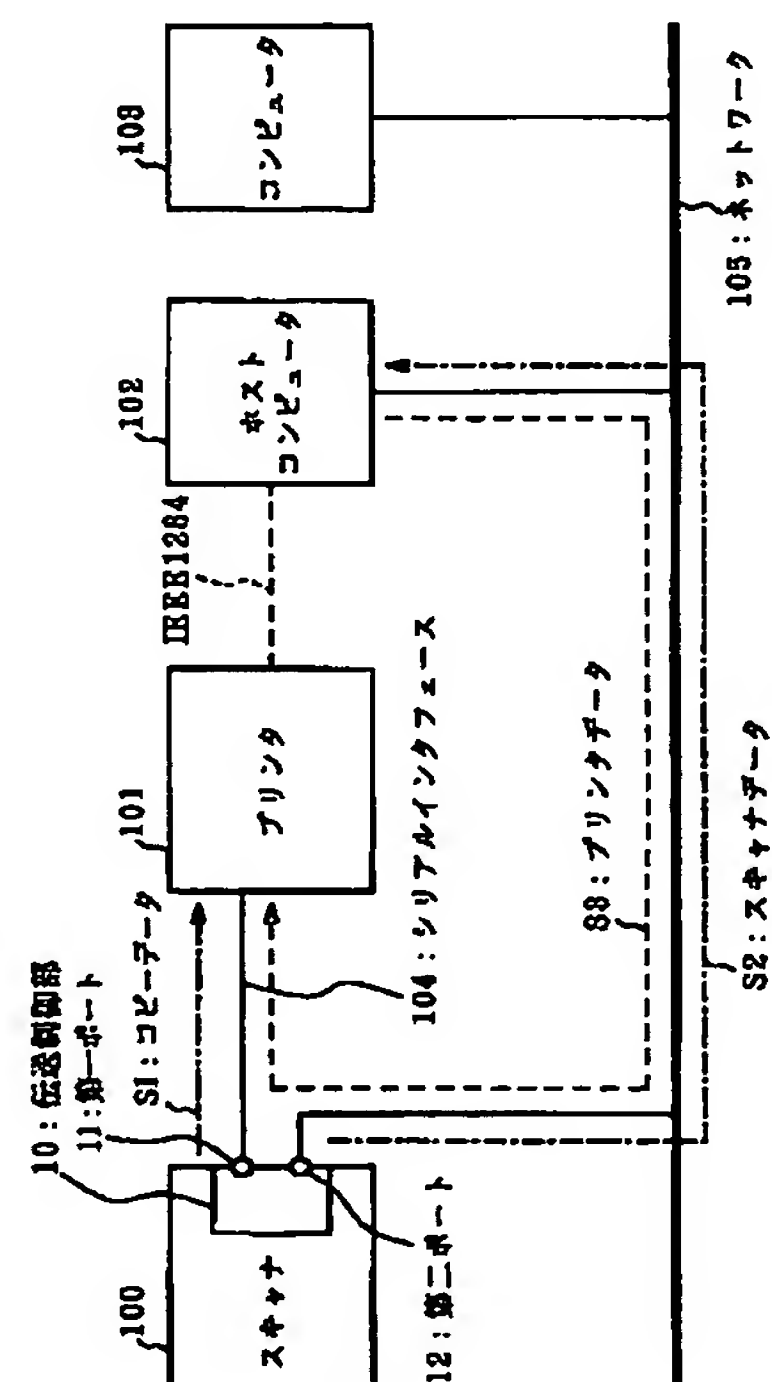
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(54) 【発明の名称】 画像入力装置及び画像情報伝送システム

(57) 【要約】

【課題】 シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送する技術の提供。

【解決手段】 プリント装置１０１に接続されるシリアルインタフェース用の第一ポート１１と、ネットワーク１０５を介してホストコンピュータ１０２に接続されるシリアルインタフェース用の第二ポート１２とを有する画像入力装置であって、当該画像入力装置内部の画像処理手段へ接続された入力画像インタフェース、第一ポート１１及び第二ポート１２相互間の伝送状態を制御する伝送制御部１０を備えることにより、スイッチングハブ機能を内蔵した構成を有する。



## 【特許請求の範囲】

【請求項1】 画像出力装置に接続されるシリアルインタフェース用の第一ポートと、ネットワーク又はホストコンピュータに接続されるシリアルインタフェース用の第二ポートとを有する画像入力装置であって、当該画像入力装置内部の画像処理手段へ接続された入力画像インタフェース、前記第一及び第二ポート相互間の伝送状態を制御する伝送制御部を備え、前記伝送制御部は、前記入力画像インタフェース、前記第一及び第二ポートのいずれかから入力された画像情報を含むデータを、当該データに付加された宛先アドレスに応じて前記第一又は第二ポートへ出力するスイッチング部を備えることを特徴とする画像入力装置。

【請求項2】 前記スイッチング部は、入力された画像情報を含むデータから検出された前記宛先アドレスに基づいて、前記入力画像インタフェース、前記第一及び第二ポートどうしを選択的に接続するスイッチングマルチプレクサを備えることを特徴とする請求項1記載の画像入力装置。

【請求項3】 前記スイッチング部は、前記入力画像インタフェース、前記第一及び第二ポートに対してそれぞれ設けられ、入力された画像情報を含むデータをシリアルデータからパラレルデータに変換し、前記宛先アドレスを検出するシリアル・パラレル変換部と、前記シリアル・パラレル変換部どうしを選択的に接続するスイッチングマルチプレクサと、前記シリアル・パラレル変換部で検出された前記宛先アドレスに基づいて、前記スイッチングマルチプレクサの接続を制御する制御部とを備えることを特徴とする請求項1又は2記載の画像入力装置。

【請求項4】 前記画像入力装置をイメージスキャナ装置とし、前記画像出力装置をプリンタ装置としたことを特徴とする請求項1、2又は3記載の画像入力装置。

【請求項5】 スイッチング部は、前記入力画像インタフェースから入力されたデジタル信号がコピーデータを含むデータである場合に、当該データを前記第一ポートへ伝送し、前記入力画像インタフェースから入力されたデジタル信号がスキャナデータを含むデータである場合に、当該データを前記第二ポートへ伝送し、前記第二ポートから入力されたデジタル信号がプリンタデータを含むデータである場合に、当該データを前記第一ポートへ伝送することを特徴とする請求項4記載の画像入力装置。

【請求項6】 前記第一ポートにのみ前記画像入力装置が接続され、スイッチング部が、前記入力画像インタフェースから入力されたコピーデータを含むデータである場合に、当該データを前記第一ポートへ伝送することを特徴とする請

求項5記載の画像入力装置。

【請求項7】 前記第一及び第二ポートを、互いに同一の構造とし、互いの接続対象を交換可能としたことを特徴とする請求項1～6のいずれかに記載の画像入力装置。

【請求項8】 請求項1記載の画像入力装置と、前記第一ポートにシリアルインタフェースを介して接続された画像出力装置と、前記第二ポートにシリアルインタフェースのネットワークを介して接続されたホストコンピュータとにより構成されることを特徴とする画像情報伝送システム。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、イメージスキャナ等の画像入力装置、及び、その画像入力装置を含む画像情報伝送システムに関し、特に、複数の装置間で画像情報をシリアルデータとして転送するための技術に関する。

## 【0002】

【従来の技術】従来のコピー専用機においては、一つの筐体の内部に、画像を読み取るスキャナ部と、読み取った画像を出力するプリンタ部とを設けている。そして、コピー速度、特にファーストコピー速度を向上させるため、スキャナ部からプリンタ部へは、画像情報やセンサ情報をパラレル伝送方式で転送していた。

【0003】さらに、近年、コンピュータの周辺機器であるイメージスキャナ装置とプリンタ装置とを組み合わせることでコピー機として機能させることが提案されている。そのような従来技術の一例が、特開平8-340412号公報に開示されている。この公報に開示の技術によれば、図5の(A)に示すように、イメージスキャナ装置200に双方向通信可能なパラレルI/Fポート203を複数設け、ホストコンピュータ202とプリンタ装置201とを繋ぐ信号線の途中にイメージスキャナ装置200を割り込ませた構成としている。そして、この構成により通常のスキャナとしての機能の他に、コピー機としての機能や、プリンタの機能を実現している。

## 【0004】

【発明が解決しようとする課題】しかしながら、上記の従来技術においては、データ量が膨大な画像情報の高速伝送を実現するため、画像情報をパラレルインタフェースを介して転送していた。このため、イメージスキャナ装置と、プリンタ装置やホストコンピュータとを接続するために、わざわざ双方向のパラレルI/Fという高価な専用のインタフェースが必要となるという問題点があった。

【0005】一方、近年、シリアル伝送方式においても、シリアルSCSI等により高速通信が可能となってきた。そこで、図5の(B)に示すように、スイッチングハブ(HUB)304を設けたシリアルインタフェー

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スのネットワークを介して、イメージスキャナ装置300と、プリンタ装置301やコンピュータ302及び303等の他の情報機器とを接続することが考えられる。

【0006】しかし、コピー機能を実現するためにイメージスキャナ装置からプリンタ装置へ大量の画像情報をネットワークを介して転送すると、コピーデータがネットワーク回線を占有してしまう。その結果、そのネットワークに接続している他の情報機器間の通信速度が低下したり、又は、通信ができなくなったりする事態が発生し得るという問題が生じる。

【0007】本発明は、上記の問題を解決すべくなされたものであり、シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送できる画像入力装置、及び、その画像入力装置を含む画像情報伝送システムの提供を目的とする。

【0008】

【課題を解決するための手段】この目的の達成を図るため、本願発明の発明者は、スイッチングハブ機能の一部分をイメージスキャナ装置に内蔵させ、イメージスキャナ装置とプリンタ装置とをネットワークと別に直接シリアルインタフェースで接続すれば、シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなくイメージスキャナ装置からプリンタ装置へ画像情報を転送できることに想到した。

【0009】そこで、本発明の請求項1に係る画像入力装置によれば、画像出力装置に接続されるシリアルインタフェース用の第一ポートと、ネットワーク又はホストコンピュータに接続されるシリアルインタフェース用の第二ポートとを有する画像入力装置であって、当該画像入力装置内部の画像処理手段へ接続された入力画像インタフェース、第一及び第二ポート相互間の伝送状態を制御する伝送制御部を備え、伝送制御部は、入力画像インタフェース、第一及び第二ポートのいずれかから入力された画像情報を含むデータを、当該データに付加された宛先アドレスに応じて第一又は第二ポートへ出力するスイッチング部を備える構成としてある。

【0010】このような構成とすれば、伝送制御部が、スイッチングハブ機能の一部分として機能するので、シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送できる。

【0011】また、請求項2記載の発明によれば、スイッチング部は、入力された画像情報を含むデータから検出された前記宛先アドレスに基づいて、前記入力画像インタフェース、前記第一及び第二ポートどうしを選択的に接続するスイッチングマルチプレクサを備える構成としてある。このような構成とすれば、伝送制御部が、スイッチングハブ機能の一部分として機能するので、シ

リアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送できる。

【0012】また、請求項3記載の発明によれば、スイッチング部は、入力画像インタフェース、第一及び第二ポートに対してそれぞれ設けられ、入力された画像情報を含むデータをシリアルデータからパラレルデータに変換し、宛先アドレスを検出するシリアル・パラレル変換部と、シリアル・パラレル変換部どうしを選択的に接続するスイッチングマルチプレクサと、シリアル・パラレル変換部で検出された宛先アドレスに基づいて、スイッチングマルチプレクサの接続を制御する制御部とを備える構成としてある。

【0013】このように、シリアルデータをパラレルデータに変換してからアドレスを比較し、スイッチングマルチプレクサの接続を制御することにより、ホストコンピュータが動作していない場合においても、スイッチングハブ機能を発揮することができる。

【0014】また、請求項4記載の発明によれば、画像入力装置をイメージスキャナ装置とし、画像出力装置をプリンタ装置とした構成としてある。これにより、イメージスキャナ装置で読み取った画像データを、シリアルインタフェースを介してプリンタ装置へ転送して出力することにより、パラレルインタフェースを用いることなく容易にコピー機能を実現することができる。

【0015】また、請求項5記載の発明によれば、スイッチング部は、入力画像インタフェースから入力されたデジタル信号がコピーデータを含むデータである場合に、当該コピーデータを第一ポートへ伝送し、入力画像インタフェースから入力されたデジタル信号がスキャナデータを含むデータである場合に、当該スキャナデータを第二ポートへ伝送し、第二ポートから入力されたデジタル信号がプリンタデータを含むデータである場合に、当該プリンタデータを第一ポートへ伝送する構成としてある。

【0016】このように構成すれば、通常のスキャナとしての機能に加えて、コピー機としての機能を実現でき、さらに、コンピュータから伝送されてきたプリンタデータをプリンタへ転送することができる。

【0017】また、請求項6記載の発明によれば、第一ポートにのみ前記画像入力装置が接続され、スイッチング部が、入力画像インタフェースから入力されたコピーデータを含むデータである場合に、当該データを第一ポートへ伝送する構成としてある。このような構成とすれば、ホストコンピュータにより制御されることなく、コピー機としての機能を容易に実現することができる。

【0018】また、請求項7記載の発明によれば、第一及び第二ポートを、互いに同一の構造とし、互いの接続対象を交換可能とした構成としてある。このようにすれば、シリアルインタフェース用の二つのポートのうち、



どちらを第一ポートとしても良いので、そのポートが第一ポートであるか否かは、そのポートに画像出力装置が接続されるか否かによって決まる。これにより、画像入力装置やネットワークを接続するポートを誤るおそれを無くすることができる。

【0019】また、本発明の請求項8記載の画像情報伝送システムによれば、請求項1記載の画像入力装置と、第一ポートにシリアルインタフェースを介して接続された画像出力装置と、第二ポートにシリアルインタフェースのネットワークを介して接続されたホストコンピュータとにより構成してある。

【0020】このように構成することにより、シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送できる。

【0021】

【発明の実施の形態】以下、本発明の実施の形態について、図面を参照して説明する。まず、図1を参照して、本発明の画像情報伝送システムの実施形態について説明する。図1に示すように、この画像情報伝送システムは、画像入力装置としてのイメージスキャナ装置100と、画像出力装置としてのプリンタ装置101と、ホストコンピュータ102及びコンピュータ103とにより構成されている。

【0022】イメージスキャナ装置100は、装置内部でスイッチングハブ機能の一部分を実現するために伝送制御部10を備えている。この伝送制御部10には、第一ポート11及び第二ポート12が設けられている。また、プリンタ装置101は、シリアルインタフェース104を介して第一ポート11に接続されている。また、ホストコンピュータ102は、シリアルインタフェースのネットワーク105を介して第二ポート12に接続されている。このネットワーク5は、例えば、イーサネット（登録商標）（Ethernet（登録商標））等のLAN（Local Area Network）により構成すると良い。

【0023】このような構成とすれば、伝送制御部10が、スイッチングハブ機能の一部分として機能するので、シリアルインタフェース104を介し、かつ、ホストコンピュータ102と接続されたネットワーク105を占有することなくプリンタ装置101へ画像情報を転送できる。

【0024】次に、伝送制御部10を内蔵したイメージスキャナ装置100の構成について、図2を参照して説明する。図2に示すように、イメージスキャナ装置100は、伝送制御部10の他に、画像入力素子1と、画像処理を行うP処理部2、C処理部3及びP処理部4と、エンジン部5と、MPU6と、ROM7と、RAM8と、操作盤9とにより構成されている。

【0025】エンジン部5は、イメージスキャナ装置100の画像読取部のカバー開閉の検出や、画像読取対象

の用紙のサイズの検出や、走査部を移動させるモータや、そのモータの回転速度の検出等のための各種のセンサ等の、画像入力素子1が画像情報を読み取るのに必要な動作を行う機能を有している。

【0026】また、画像入力素子1は、CCDやCIS等の光電変換素子により構成されている。そして、画像入力素子1が読み込んだ画像情報は、先ず、P処理部2へ送られる。P処理部2では、画像情報に対して、A/D変換を行い、画像入力素子の入力特性のばらつきや、光源の発光素子の光強度のばらつき等による画像情報のばらつきを補正する初期的な処理を行う。そして、画像情報をコピーデータとして利用する場合には、初期的な処理が施された画像情報を、例えばC処理部3へ送る。また、画像情報をスキャナデータとして利用する場合には、初期的な処理が施された画像情報を、例えばS処理部4へ転送する。

【0027】なお、ここでコピーデータとは、コピー機能を実現するために、イメージスキャナ装置100からプリンタ装置101へ転送される画像情報を指す。さらに、コピーデータを含むデータとは、コピーデータの他に、例えば、プリンタを制御するためのデータ等を含むコピーに関連するデータを指す。また、スキャナデータとは、周辺機器としてのスキャナ機能を実現するために、イメージスキャナ装置100からホストコンピュータ102へ転送される画像情報を指す。さらに、スキャナデータを含むデータとは、スキャナデータの他に、例えば、スキャナに関する情報等を含むスキャナに関連するデータを指す。

【0028】また、画像情報をコピーデータとして利用するのか、スキャナデータとして利用するのかは、例えば、操作盤9から指示しても良いし、ネットワーク105を介してホストコンピュータ102から指示しても良い。また、操作盤9やホストコンピュータ102から、画像情報の用途の他に、読取画像の枚数、画質、濃度や、画像の拡大、縮小や、用紙選択等の各種の設定も行うことができる。

【0029】そして、C処理部3では、画像のエッジ検出、積分処理、微分処理、拡大・縮小、回転、誤差拡散等の、コピーとしての画質を作るための画像処理を行い、コピーデータを生成する。生成されたコピーデータは、いったんRAM8に格納される。RAM8に格納する際には、いったんデータを圧縮しても良い。また、RAM8に格納されたコピーデータには、MPU6により、プリンタ101を宛先とする宛先アドレスがデジタル信号のヘッダ情報として付加される。この宛先アドレスは、ROM7内にIPアドレスのテーブルとして格納されている。そして、宛先アドレスが付加されたコピーデータは、入力画像インタフェース13及び伝送制御部10を経て、第一ポート11からシリアルインタフェースを介してプリンタ101へ送出される。

【0030】S処理部4では、画像情報の量子化、ファイル化、圧縮等の処理を行い、スキャナデータを生成する。生成されたスキャナデータは、コピーデータの場合と同様に、いったんRAM8に格納される。また、RAM8に格納されたスキャナデータには、MPU6により、ホストコンピュータ102を宛先とする宛先アドレスがデジタル信号のヘッダ情報として付加される。この宛先アドレスも、ROM7内にIPアドレスのテーブルとして格納されている。そして、宛先アドレスが付加されたスキャナデータは、入力画像インタフェース13及び

【0031】次に、スイッチングハブ機能を実現するための伝送制御装置10の構成について、図3を参照して説明する。伝送制御装置10は、入力画像インタフェース13、第一ポート11及び第二ポート12相互間の伝送状態を制御する装置である。そのために、伝送制御装置10は、図3に示すように、スイッチングブロック15を備えている。このスイッチングブロック15は、制御部14を介して入力画像インタフェース13に接続され、物理層(PHY)16を介して第一ポート11に接続され、かつ、物理層(PHY)17を介して第二ポート12に接続されている。なお、制御部14とスイッチングブロック15との間に、さらに物理層を挿入しても良い。

【0032】そして、伝送制御装置10は、スイッチングハブ機能を実現するため、スイッチングブロック15により、入力画像インタフェース13、第一ポート11及び第二ポート12のいずれかから入力される画像情報を、当該画像情報に付加された宛先アドレスに応じて伝送経路を切替えて、第一ポート11又は第二ポート12へ出力する。

【0033】具体的には、スイッチングブロック15は、入力画像インタフェース13から入力された画像情報がコピーデータを含むデータ(以下、コピーデータS1と表記する。)である場合、そのコピーデータS1を第一ポート11へ伝送し、宛先アドレスの示すプリンタ101へ送出する。なお、図1及び図3においては、コピーデータS1の伝送経路を模式的に二点鎖線で示している。

【0034】また、スイッチングブロック15は、入力画像インタフェース13から入力された画像情報がスキャナデータを含むデータ(以下、スキャナデータS2と表記する。)である場合、そのスキャナデータを第二ポート12へ伝送し、宛先アドレスの示すホストコンピュータ102へ送出する。なお、図1及び図3において

は、スキャナデータS2の伝送経路を模式的に一点鎖線で示し、

【0035】また、スイッチングブロック15は、第二ポート12からプリンタデータを含むデータ(以下、プリンタデータS3と表記する。)が入力された場合に、そのプリンタデータを第一ポート11へ伝送し、宛先アドレスの示すプリンタ101へ送出する。なお、図1及び図3においては、プリンタデータS3の伝送経路を模式的に破線で示している。

【0036】したがって、本実施形態のイメージスキャナ装置100は、通常のスキャナとしての機能に加えて、コピー機としての機能を実現でき、さらに、ホストコンピュータ102等から伝送されてきたプリンタデータをプリンタ101へ転送することもできる。また、プリンタデータとは、ホストコンピュータ102からイメージスキャナ装置100を介してプリンタ装置101へ転送される画像情報を指す。さらに、プリンタデータを含むデータとは、プリンタデータの他に、例えば、プリンタの制御情報等を含むプリンタに関連するデータを指す。なお、図1に示すように、プリンタデータの伝送経路として、プリンタデータをホストコンピュータ102からプリンタ101へIEEE1284により直接伝送する経路を設けても良い。

【0037】次に、スイッチングブロック15の構成例について、図4を参照して説明する。図4に示すように、スイッチングブロック15は、入力画像インタフェース13、第一ポート11及び第二ポート12に対してそれぞれ設けられたシリアル・パラレル変換部(S/P)51、52及び53と、これらシリアル・パラレル変換部51、52及び53どうしを選択的に接続するスイッチングマルチプレクサ54と、制御部55と、バッファメモリと56と、MPU57と、ROM58とRAM59と、MPUインタフェース(MPUI/F)60とにより構成されている。

【0038】シリアル・パラレル変換部51、52及び53では、入力された画像情報等の各種データをシリアルデータからパラレルデータに変換するとともに、当該データに付加されている宛先アドレスを検出する。検出された宛先アドレスは、制御部55へ送られる。

【0039】制御部55では、宛先アドレスの比較を行う。比較対象のアドレスは、MPU57により、MPUバス及びMPUインタフェース60を経て制御部55へ転送され、保持されている。なお、RAM59は、MPU57の作業領域として設けられている。

【0040】そして、制御部55では、宛先アドレスの比較結果に基づいて、スイッチングマルチプレクサ54の接続を制御する。具体的には、例えば、入力画像インタフェース13からシリアル・パラレル変換部52に入力された画像情報を含むデータに付加された宛先アドレスが、プリンタ装置101のIPアドレスを示している

場合、すなわち、画像情報がコピーデータである場合、スイッチングマルチプレクサ54は、シリアル・パラレル変換部52とシリアル・パラレル変換部51とを接続する。その結果、コピーデータは、ネットワーク105を占有することなく、図1に示したように、第一ポート11からシリアルインタフェース104を介してプリンタ装置101へ伝送されることになる。

【0041】また、例えば、入力画像インタフェース13からシリアル・パラレル変換部52に入力された画像情報に付加された宛先アドレスが、ホストコンピュータ102のIPアドレスを示している場合、すなわち、画像情報がスキャナデータである場合、スイッチングマルチプレクサ54は、シリアル・パラレル変換部52とシリアル・パラレル変換部53とを接続する。その結果、スキャナデータは、図1に示したように、第二ポート12からネットワーク105を介して、ホストコンピュータ102へ伝送されることになる。

【0042】また、例えば、第二ポート12からシリアル・パラレル変換部53に入力された画像情報に付加された宛先アドレスが、プリンタ装置101のIPアドレスを示している場合、すなわち、画像情報がプリンタデータである場合、スイッチングマルチプレクサ54は、シリアル・パラレル変換部53とシリアル・パラレル変換部51とを接続する。その結果、プリンタデータは、第一ポート11からネットワーク105を介して、ホストコンピュータ102へ伝送されることになる。したがって、図1に示したように、ホストコンピュータ102から送出されたプリンタデータは、イメージスキャナ装置100からプリンタ装置101へ転送されることになる。

【0043】このように、シリアルデータをパラレルデータに変換してからアドレスを比較し、スイッチングマルチプレクサ54の接続を制御することにより、ホストコンピュータ102が動作していない場合においても、スイッチングハブ機能を発揮することができる。

【0044】上述した実施の形態においては、本発明を特定の条件で構成した例について説明したが、本発明は、種々の変更を行うことができる。例えば、上述した実施の形態においては、画像入力装置としてイメージスキャナの例について説明したが、本発明では、画像入力装置はイメージスキャナに限定されない。この発明は、例えば、デジタルカメラ等の画像情報をデジタル信号として取り込むことができる情報機器一般に適用することができる。

【0045】

【発明の効果】以上、詳細に説明したように、本発明によれば、画像入力装置に、スイッチングハブ機能の一部

分として機能する伝送制御部を設けたので、シリアルインタフェースを介し、かつ、ホストコンピュータと接続されたネットワークを占有することなく画像出力装置へ画像情報を転送することができる。

【図面の簡単な説明】

【図1】実施形態の画像情報伝送システムの構成を説明するためのブロック図である。

【図2】実施形態の画像入力装置の構成を説明するためのブロック図である。

【図3】画像入力装置の伝送制御部の構成を説明するためのブロック図である。

【図4】伝送制御部のスイッチング部の構成を説明するためのブロック図である。

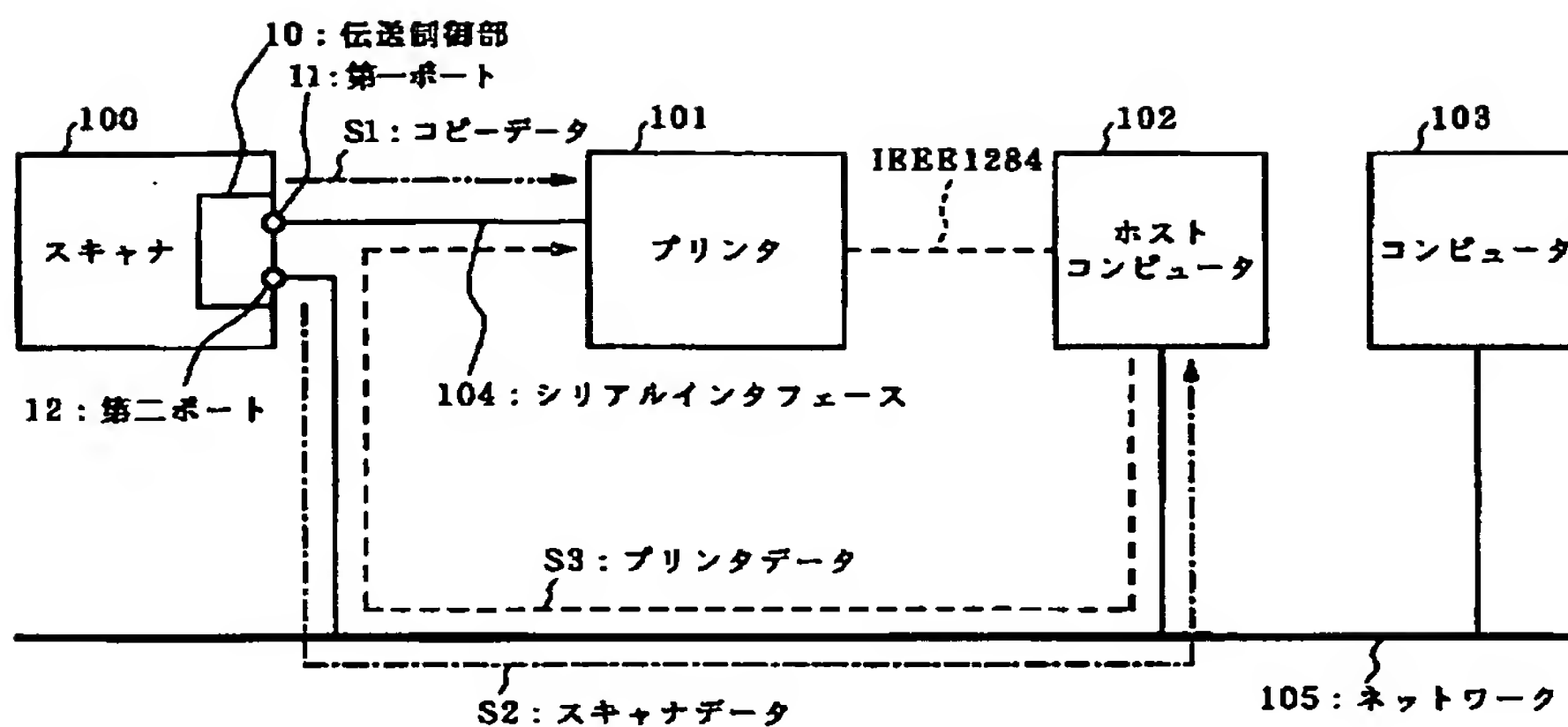
【図5】(A)は、従来例を説明するためのブロック図であり、(B)は、HUBを介したネットワークを説明するためのブロック図である。

【符号の説明】

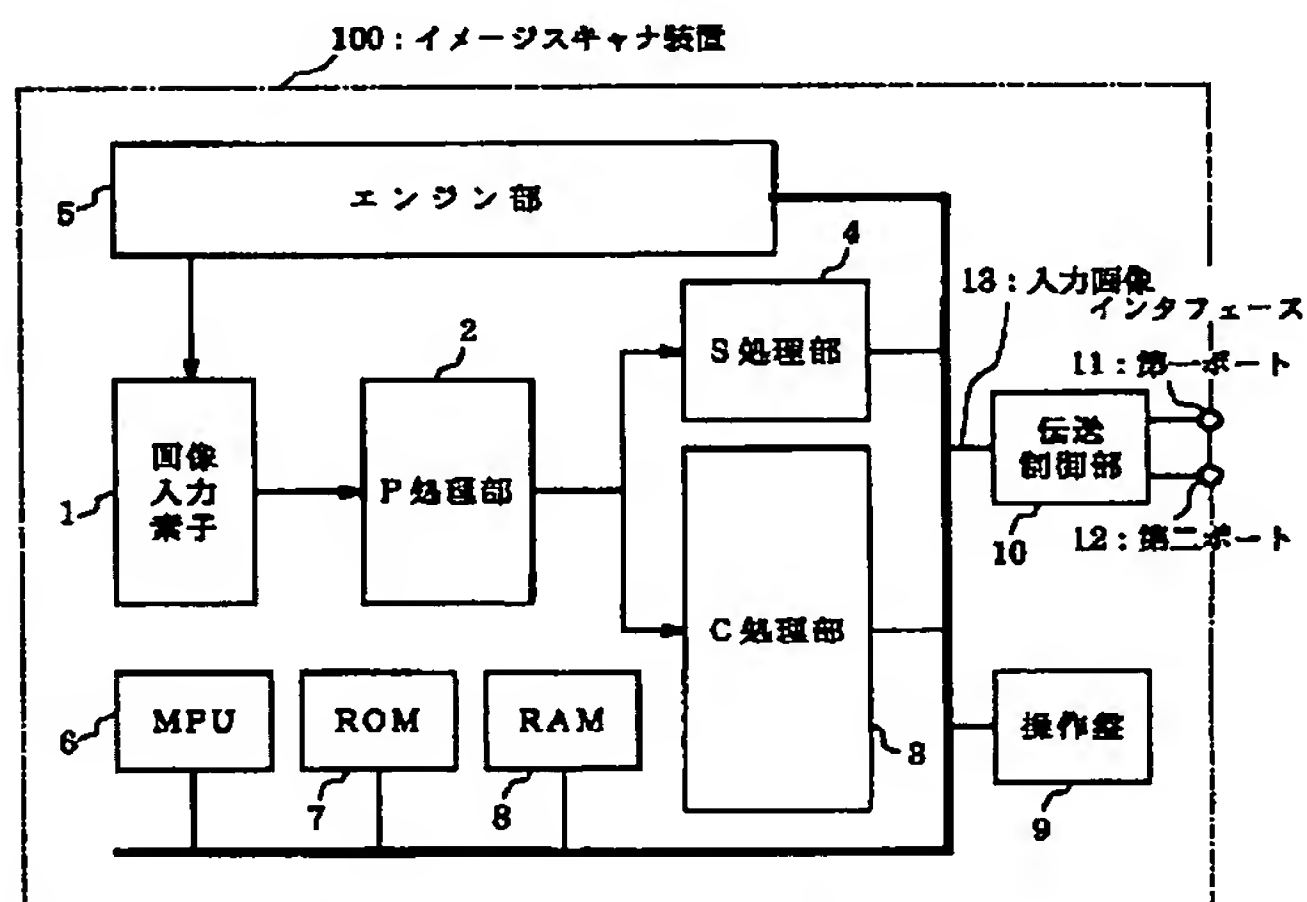
- 1 画像入力素子
- 2 P処理部
- 3 C処理部
- 4 S処理部
- 5 エンジン部
- 6 MPU
- 7 ROM
- 8 RAM
- 9 操作盤
- 10 伝送制御部
- 11 第一ポート
- 12 第二ポート
- 13 入力画像インタフェース
- 14 制御部
- 15 スwitchングブロック
- 16、17 物理層(PHY)
- 18 画像シリアルインタフェース
- 51、52、53 シリアル・パラレル変換部
- 54 スwitchングマルチプレクサ(SWMUX)
- 55 制御部
- 56 バッファメモリ
- 57 MPU
- 58 ROM
- 59 RAM
- 60 MPUインタフェース
- 100、200、300 イメージスキャナ装置
- 101、201、301 プリンタ装置
- 102、103、202、302、303 コンピュータ



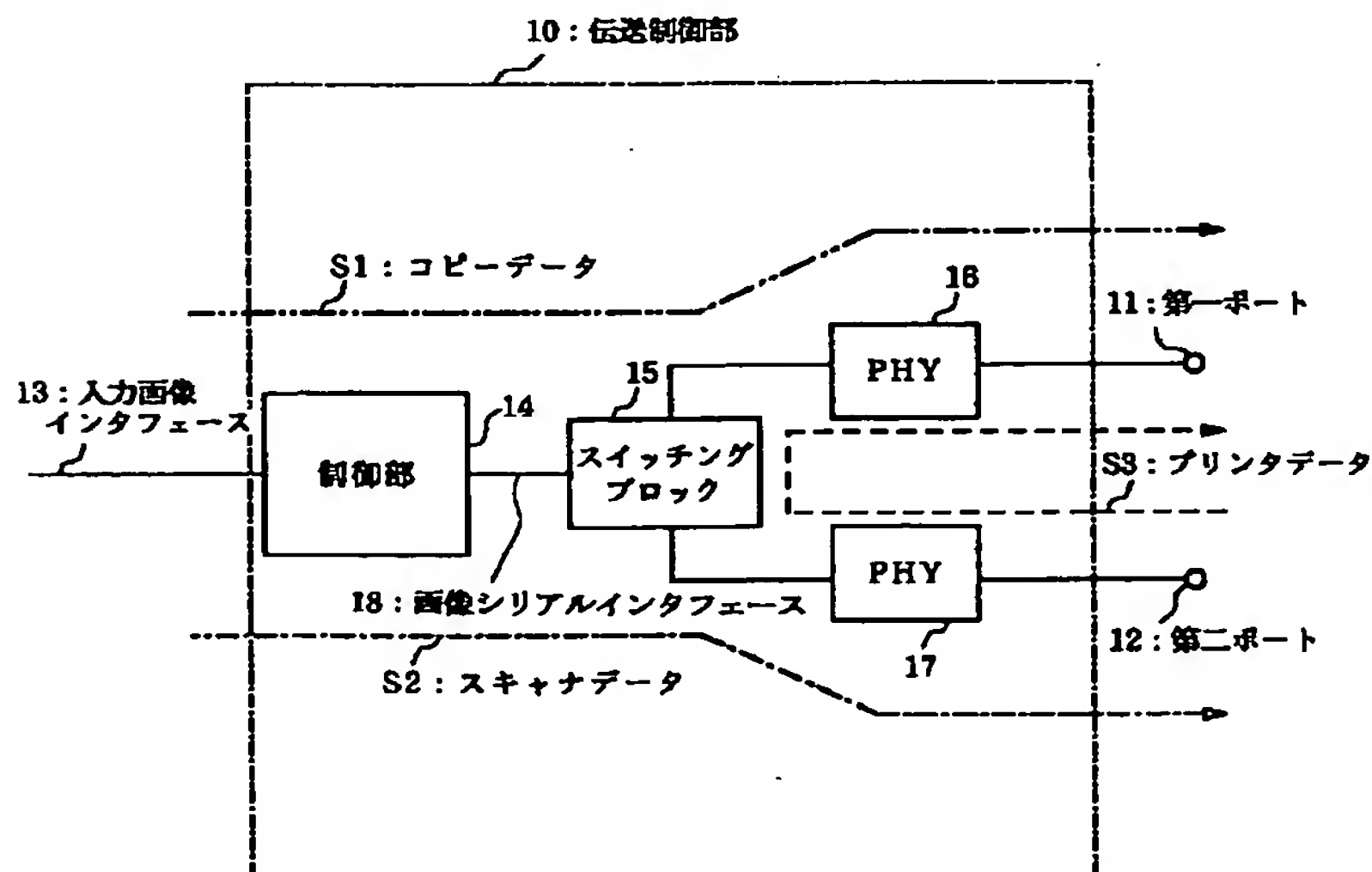
【図1】



【図2】

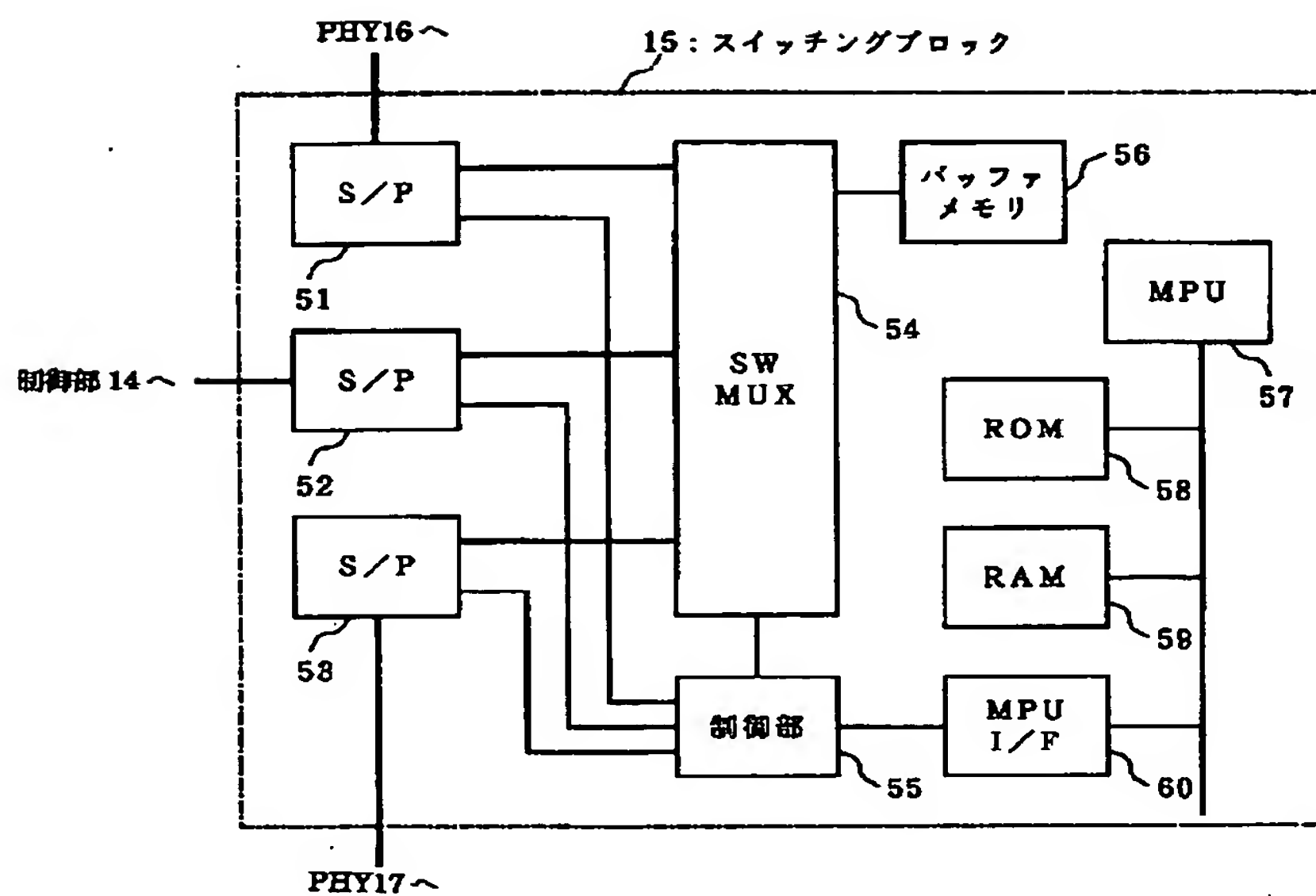


【図3】

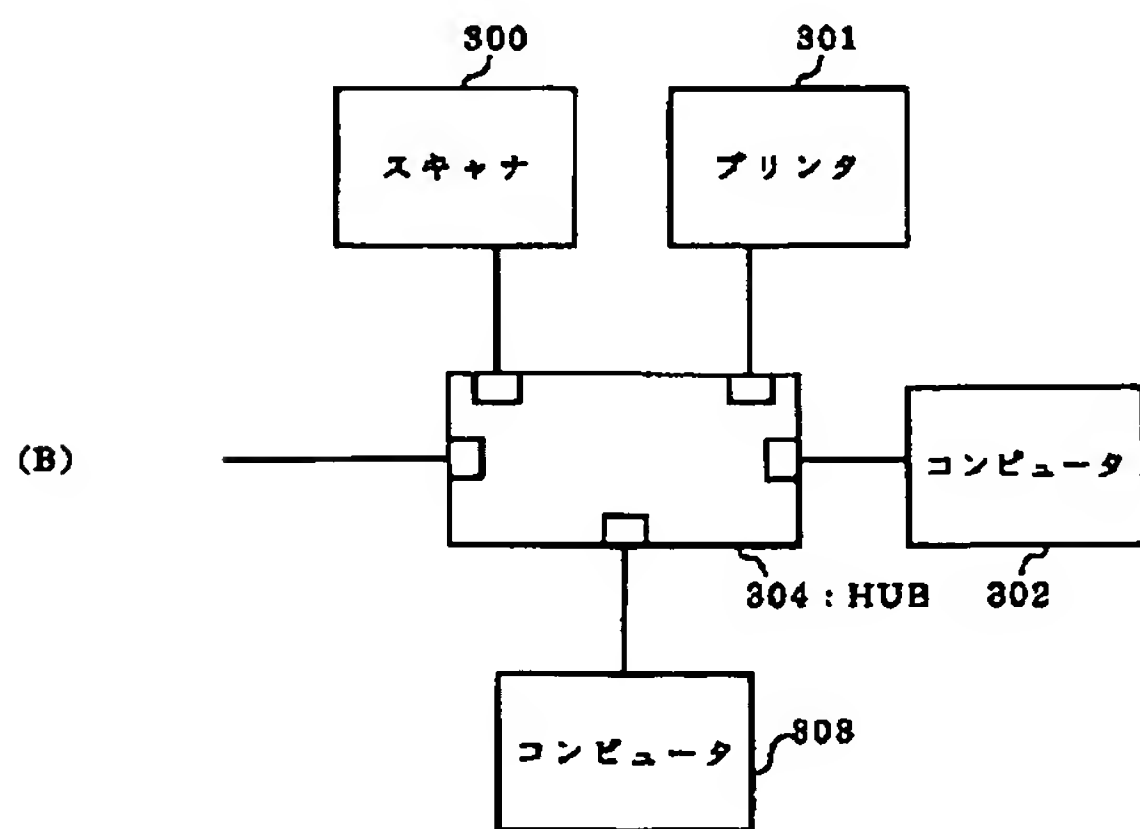
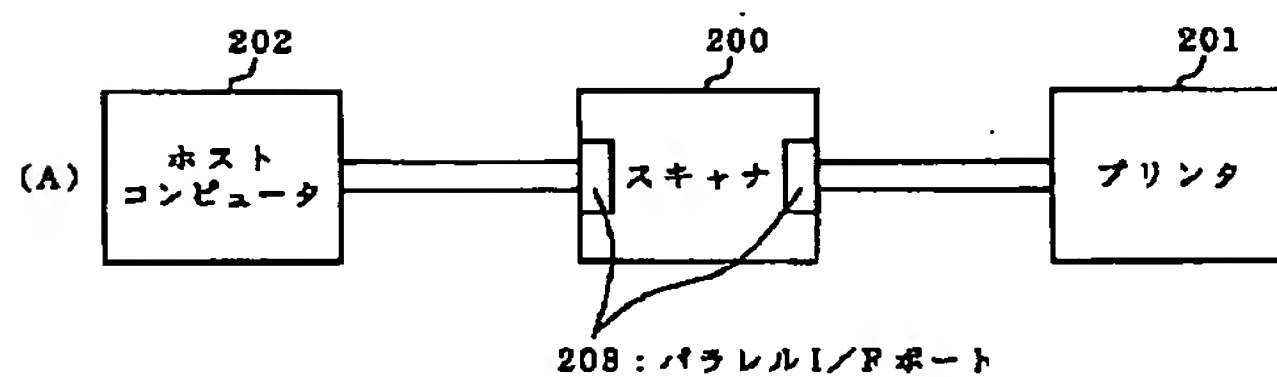




【図4】



【図5】



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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention]However, in the above-mentioned conventional technology, in order to realize high-speed transmission of picture information with huge data volume, picture information was transmitted via the parallel interface. For this reason, in order to connect an image scanner unit, and a printer and a host computer, there was a problem that an expensive interface for exclusive use called bidirectional parallel I/F was needed specially. [0005]On the other hand, also in a serial transmission system, high speed communication has become possible by Serial SCSI etc. in recent years. Then, as shown in (B) of drawing 5, it is possible to connect the image scanner unit 300 and other information machines and equipment of the printer 301, the computer 302, and 303 grades via the network of the serial interface which formed the switching hub (HUB) 304.

[0006]However, if a lot of picture information is transmitted to a printer via a network from an image scanner unit in order to realize a copy function, copy data will occupy a network line. As a result, the problem that the situation where the transmission speed between other information machines and equipment linked to the network does not fall, or communication becomes impossible may occur arises.

[0007]This invention is made that the above-mentioned problem should be solved, and via serial interface, And it aims at offer of the picture input device which can transmit picture information to an image output device without occupying the network connected with the host computer, and the image information transmission system containing the picture input device.

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[Translation done.]

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the art for transmitting picture information as serial data among two or more devices especially about picture input devices, such as an image scanner, and the image information transmission system containing the picture input device.

[0002]

[Description of the Prior Art]The conventional copy special-purpose-machine smell has provided the scanner part which reads a picture inside one case, and the printer section which outputs the read picture. And in order to raise a copy speed, especially a first copy speed, picture information and sensor information were transmitted to the printer section with the parallel transmission system from the scanner part.

[0003]Making it function as a copy machine combining the image scanner unit and printer which are peripheral equipment of a computer is proposed in recent years. An example of such conventional technology is indicated by JP,8-340412,A. According to the art of an indication in this gazette, as shown in (A) of drawing 5, two or more parallel I/F ports 203 in which two-way communication is possible are established in the image scanner unit 200, It has composition in which it was made to sink below the image scanner unit 200 in the middle of the signal wire which connects the host computer 202 and the printer 201. And this composition has realized the function as a copy machine and the function of a printer other than the function as a usual scanner.

[0004]

[Problem(s) to be Solved by the Invention]However, in the above-mentioned conventional technology, in order to realize high-speed transmission of picture information with huge data volume, picture information was transmitted via the parallel interface. For this reason, in order

to connect an image scanner unit, and a printer and a host computer, there was a problem that an expensive interface for exclusive use called bidirectional parallel I/F was needed specially.

[0005]On the other hand, also in a serial transmission system, high speed communication has become possible by Serial SCSI etc. in recent years. Then, as shown in (B) of drawing 5, it is possible to connect the image scanner unit 300 and other information machines and equipment of the printer 301, the computer 302, and 303 grades via the network of the serial interface which formed the switching hub (HUB) 304.

[0006]However, if a lot of picture information is transmitted to a printer via a network from an image scanner unit in order to realize a copy function, copy data will occupy a network line. As a result, the problem that the situation where the transmission speed between other information machines and equipment linked to the network does not fall, or communication becomes impossible may occur arises.

[0007]This invention is made that the above-mentioned problem should be solved, and via serial interface, And it aims at offer of the picture input device which can transmit picture information to an image output device without occupying the network connected with the host computer, and the image information transmission system containing the picture input device.

[0008]

[Means for Solving the Problem]In order to aim at achievement of this purpose, an artificer of the invention in this application, If a part of switching hub function is made to build in an image scanner unit and an image scanner unit and a printer are directly connected with serial interface apart from a network, It thought out for picture information to be transmitted to a printer from an image scanner unit, without occupying a network connected with a host computer via serial interface.

[0009]Then, the first port for serial interface that is connected to an image output device according to the picture input device concerning claim 1 of this invention, It is a picture input device which has the second port for serial interface connected to a network or a host computer, Have a transmission control part which controls a transmission state between an inputted image interface connected to an image processing means inside the picture input device concerned, the first, and the second port, and a transmission control part, It has composition provided with a switching section which outputs data containing picture information inputted from either an inputted image interface, the first and the second port to the first or the second port according to a destination address to which it was added by the data concerned.

[0010]If it has such composition, since a transmission control part functions as a part of switching hub function, it can transmit picture information to an image output device, without occupying a network connected with a host computer via serial interface.

[0011]According to the invention according to claim 2, a switching section is considered as



composition provided with a switching multiplexer which connects selectively said inputted image interface, said first, and the second port based on said destination address detected from data containing inputted picture information. If it has such composition, since a transmission control part functions as a part of switching hub function, it can transmit picture information to an image output device, without occupying a network connected with a host computer via serial interface.

[0012]According to the invention according to claim 3, a switching section, A serial-parallel-conversion part which changes data which is provided to an inputted image interface, the first, and the second port, respectively, and contains inputted picture information into parallel data from serial data, and detects a destination address, It has composition provided with a switching multiplexer which connects serial-parallel-conversion parts selectively, and a control section which controls connection of a switching multiplexer based on a destination address detected in a serial-parallel-conversion part.

[0013]Thus, after changing serial data into parallel data, when the host computer is not operating by comparing an address and controlling connection of a switching multiplexer, a switching hub function can be exhibited.

[0014]According to the invention according to claim 4, a picture input device is used as an image scanner unit, and it has composition which made an image output device a printer. A copy function can be easily realized by this transmitting and outputting image data read with an image scanner unit to a printer via serial interface, without using a parallel interface.

[0015]According to the invention according to claim 5, a switching section, When a digital signal inputted from an inputted image interface is data containing copy data, When a digital signal which transmitted the copy data concerned to the first port, and was inputted from an inputted image interface is data containing scanner data, The scanner data concerned are transmitted to the second port, and when a digital signal inputted from the second port is data containing printer data, it has composition which transmits the printer data concerned to the first port.

[0016]if constituted in this way -- a function as a usual scanner -- in addition, a function as a copy machine can be realized and printer data transmitted from a computer can be further transmitted to a printer.

[0017]According to the invention according to claim 6, said picture input device is connected only to the first port, and when a switching section is data containing copy data inputted from an inputted image interface, it has composition which transmits the data concerned to the first port. A function as a copy machine can be realized easily, without being controlled by a host computer, if it has such composition.

[0018]According to the invention according to claim 7, the first and the second port are mutually made into the same structure, and it has composition which made a mutual

connection object exchangeable. Since it is good also considering which as the first port among two ports for serial interface if it does in this way, it is decided [ whether an image output device is connected to the port, and ] whether the port will be the first port. A possibility that this may mistake a port which connects a picture input device and a network can be abolished.

[0019]According to the image information transmission system of this invention according to claim 8, the picture input device according to claim 1, An image output device connected to the first port via serial interface and a host computer connected to the second port via a network of serial interface constitute.

[0020]By constituting in this way, picture information can be transmitted to an image output device, without occupying a network connected with a host computer via serial interface.

[0021]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings. First, with reference to drawing 1, the embodiment of the image information transmission system of this invention is described. As shown in drawing 1, this image information transmission system is constituted by the image scanner unit 100 as a picture input device, the printer 101 as an image output device, and the host computer 102 and the computer 103.

[0022]The image scanner unit 100 is provided with the transmission control part 10 in order to realize a part of switching hub function inside a device. The first port 11 and the second port 12 are established in this transmission control part 10. The printer 101 is connected to the first port 11 via the serial interface 104. The host computer 102 is connected to the second port 12 via the network 105 of serial interface. This network 5 is good for LAN (Local Area Network), such as Ethernet (registered trademark) (Ethernet (registered trademark)), to constitute for example.

[0023]If it has such composition, since the transmission control part 10 functions as a part of switching hub function, it can transmit picture information to the printer 101, without occupying the network 105 connected with the host computer 102 via the serial interface 104.

[0024]Next, the composition of the image scanner unit 100 which contained the transmission control part 10 is explained with reference to drawing 2. As shown in drawing 2, the image scanner unit 100 is constituted by the P treating part 2, the C treating part 3 and the P treating part 4 which perform the image input element 1 and image processing other than the transmission control part 10, the engine part 5, MPU6, ROM7 and RAM8, and the distribution power board 9.

[0025]The engine part 5 Detection of covering opening and closing of the image reading part of the image scanner unit 100, It has the function to perform operation required for the image input elements 1, such as various kinds of sensors for detection etc. of the revolving speed of

detection of the size of the paper for image reading, the motor to which a scanning section is moved, and its motor, to read picture information.

[0026]The image input element 1 is constituted by optoelectric transducers, such as CCD and CIS. And the picture information which the image input element 1 read is first sent to the P treating part 2. In the P treating part 2, to picture information, an A/D conversion is performed and first stage processing which amends dispersion in the picture information by dispersion in the input characteristics of an image input element, dispersion of the light intensity of the light emitting device of a light source, etc. is performed. And in using picture information as copy data, it sends the picture information to which first stage processing was performed, for example to the C treating part 3. In using picture information as scanner data, it transmits the picture information to which first stage processing was performed, for example to the S treating part 4.

[0027]Copy data refers to the picture information transmitted to the printer 101 from the image scanner unit 100 here, in order to realize a copy function. The data containing copy data refers to the data relevant to the copy which contains the data for controlling a printer other than copy data, etc., for example. Scanner data refer to the picture information transmitted to the host computer 102 from the image scanner unit 100, in order to realize the scanner function as peripheral equipment. The data containing scanner data refers to the data relevant to a scanner including the information about a scanner, etc. besides scanner data, for example.

[0028]Whether it is used as scanner data whether picture information is used as copy data may point from the distribution power board 9, and it may point from the host computer 102 via the network 105, for example. The number of sheets of a read picture, image quality, concentration, expansion of a picture and reduction, and setting out of various kinds, such as paper selection, can also be performed besides the use of picture information from the distribution power board 9 or the host computer 102.

[0029]And in the C treating part 3, image processing for making the image quality as a copy of the edge detection of a picture, integration treatment, a differential process, zooming, rotation, error diffusion, etc. is performed, and copy data is generated. The generated copy data is once stored in RAM8. When stored in RAM8, data may once be compressed. The destination address which makes the printer 101 an address is added to the copy data stored in RAM8 by MPU6 as header information of a digital signal. This destination address is stored as a table of an IP address in ROM7. And the copy data in which the destination address was added is sent out via serial interface through the inputted image interface 13 and the transmission control part 10 to the printer 101 from the first port 11.

[0030]In the S treating part 4, quantization of picture information, file-izing, compression, etc. are processed, and scanner data are generated. The generated scanner data are once stored in RAM8 like the case of copy data. The destination address which makes the host computer



102 an address is added to the scanner data stored in RAM8 by MPU6 as header information of a digital signal. This destination address is also stored as a table of an IP address in ROM7. And the scanner data in which the destination address was added are sent out via serial interface through the inputted image interface 13 and the transmission control part 10 to the host computer 102 from the second port 12. The control section 14 may include this control section 14 and the inputted image interface 13 in an image processing means, although connected to the image processing means (the C treating part 3 and the S treating part 4) via the inputted image interface 13.

[0031]Next, the composition of the transmission control unit 10 for realizing a switching hub function is explained with reference to drawing 3. The transmission control unit 10 is a device which controls the transmission state the inputted image interface 13, the first port 11, and between second port 12. Therefore, the transmission control unit 10 is provided with the switching block 15 as shown in drawing 3. It is connected to the inputted image interface 13 via the control section 14, and is connected to the first port 11 via the physical layer (PHY) 16, and this switching block 15 is connected to the second port 12 via the physical layer (PHY) 17. The physical layer may be further inserted between the control section 14 and the switching block 15.

[0032]And in order that the transmission control unit 10 may realize a switching hub function, With the switching block 15, a transmission route is changed according to the destination address to which the picture information inputted from either the inputted image interface 13, the first port 11 and the second port 12 was added by the picture information concerned, and it outputs to the first port 11 or the second port 12.

[0033]The data in which the picture information into which the switching block 15 was inputted from the inputted image interface 13 specifically contains copy data. (it is hereafter written as the copy data S1.) -- it is -- a case -- the copy data S1 -- the first -- it transmits to port 11 and sends out to the printer 101 which a destination address shows. In drawing 1 and drawing 3, the two-dot chain line shows the transmission route of the copy data S1 typically.

[0034]The data in which the picture information into which the switching block 15 was inputted from the inputted image interface 13 contains scanner data. (it is hereafter written as the scanner data S2.) -- it is -- a case -- the scanner data -- the second -- it transmits to port 12 and sends out to the host computer 102 which a destination address shows. In drawing 1 and drawing 3, a dashed dotted line shows the transmission route of the scanner data S2 typically,

[0035]When the data (it is hereafter written as the printer data S3.) which contains printer data from the second port 12 is inputted, the switching block 15 transmits the printer data to the first port 11, and sends it out to the printer 101 which a destination address shows. In drawing 1 and drawing 3, the dashed line shows the transmission route of the printer data S3 typically.

[0036]therefore, the image scanner unit 100 of this embodiment -- the function as a usual



scanner -- in addition, the function as a copy machine can be realized and the printer data transmitted from the host computer 102 grade can also be further transmitted to the printer 101. Printer data refers to the picture information transmitted to the printer 101 via the image scanner unit 100 from the host computer 102. The data containing printer data refers to the data relevant to a printer including the control information on a printer other than printer data, etc., for example. As shown in drawing 1, the course which transmits printer data to the printer 101 directly by IEEE 1284 from the host computer 102 may be established as a transmission route of printer data.

[0037]Next, the example of composition of the switching block 15 is explained with reference to drawing 4. As shown in drawing 4, the switching block 15, The serial-parallel-conversion parts (S/P) 51, 52, and 53 provided to the inputted image interface 13, the first port 11, and the second port 12, respectively, It is constituted by the switching multiplexer 54 which connects selectively these serial-parallel-conversion parts 51 and 52 and 53, the control section 55, a buffer memory and 56, MPU57, ROM58 and RAM59, and the MPU interface (MPUI/F) 60.

[0038]In the serial-parallel-conversion parts 51, 52, and 53, while changing various data, such as inputted picture information, into parallel data from serial data, the destination address added to the data concerned is detected. The detected destination address is sent to the control section 55.

[0039]A destination address is compared in the control section 55. Through the MPU bus and the MPU interface 60, the address of a comparison object is transmitted to the control section 55 by MPU57, and is held. RAM59 is provided as workspace of MPU57 and is.

[0040]And based on the comparison result of a destination address, connection of the switching multiplexer 54 is controlled by the control section 55. The destination address added to the data which specifically contains the picture information inputted into the serial-parallel-conversion part 52 from the inputted image interface 13, for example, When the IP address of the printer 101 is shown (i.e., when picture information is copy data), the switching multiplexer 54 connects the serial-parallel-conversion part 52 and the serial-parallel-conversion part 51. As a result, without occupying the network 105, copy data will be transmitted to the printer 101 via the serial interface 104 from the first port 11, as shown in drawing 1.

[0041]The destination address added to the picture information inputted into the serial-parallel-conversion part 52 from the inputted image interface 13, for example, When the IP address of the host computer 102 is shown (i.e., when picture information is scanner data), the switching multiplexer 54 connects the serial-parallel-conversion part 52 and the serial-parallel-conversion part 53. As a result, scanner data will be transmitted to the host computer 102 via the network 105 from the second port 12, as shown in drawing 1.

[0042]The destination address added to the picture information inputted into the serial-parallel-conversion part 53 from the second port 12, for example, When the IP address of the printer

101 is shown (i.e., when picture information is printer data), the switching multiplexer 54 connects the serial-parallel-conversion part 53 and the serial-parallel-conversion part 51. As a result, printer data will be transmitted to the host computer 102 via the network 105 from the first port 11. Therefore, as shown in drawing 1, the printer data sent out from the host computer 102 will be transmitted to the printer 101 from the image scanner unit 100.

[0043] Thus, after changing serial data into parallel data, when the host computer 102 is not operating by comparing an address and controlling connection of the switching multiplexer 54, a switching hub function can be exhibited.

[0044] In the embodiment mentioned above, although the example which constituted this invention from specific conditions was explained, this invention can make various change. For example, in the embodiment mentioned above, although the example of the image scanner was explained as a picture input device, by this invention, a picture input device is not limited to an image scanner. This invention can apply picture information, such as a digital camera, to the general information machines and equipment which can be incorporated as a digital signal, for example.

[0045]

[Effect of the Invention] As mentioned above, since the transmission control part which functions on a picture input device as a part of switching hub function was provided according to this invention as explained in detail, Picture information can be transmitted to an image output device, without occupying the network connected with the host computer via serial interface.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]It is a block diagram for explaining the composition of the image information transmission system of an embodiment.

[Drawing 2]It is a block diagram for explaining the composition of the picture input device of an embodiment.

[Drawing 3]It is a block diagram for explaining the composition of the transmission control part of a picture input device.

[Drawing 4]It is a block diagram for explaining the composition of the switching section of a transmission control part.

[Drawing 5](A) is a block diagram for explaining a conventional example, and (B) is a block diagram for explaining the network through HUB.

[Description of Notations]

- 1 Image input element
- 2 P treating part
- 3 C treating part
- 4 S treating part
- 5 Engine part
- 6 MPU
- 7 ROM
- 8 RAM
- 9 Distribution power board
- 10 Transmission control part
- 11 The first port
- 12 The second port
- 13 Inputted image interface

14 Control section  
15 Switching block  
16 and 17 Physical layer (PHY)  
18 Picture serial interface  
51, 52, 53 serial-parallel-conversion parts  
54 Switching multiplexer (SWMUX)  
55 Control section  
56 Buffer memory  
57 MPU  
58 ROM  
59 RAM  
60 MPU interface  
100, 200, 300 image scanner units  
101, 201, 301 printers  
102, 103, 202, 302, and 303 Computer

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## MEANS

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[Means for Solving the Problem]In order to aim at achievement of this purpose, an artificer of the invention in this application, If a part of switching hub function is made to build in an image scanner unit and an image scanner unit and a printer are directly connected with serial interface apart from a network, It thought out for picture information to be transmitted to a printer from an image scanner unit, without occupying a network connected with a host computer via serial interface.

[0009]Then, the first port for serial interface that is connected to an image output device according to the picture input device concerning claim 1 of this invention, It is a picture input device which has the second port for serial interface connected to a network or a host computer, Have a transmission control part which controls a transmission state between an inputted image interface connected to an image processing means inside the picture input device concerned, the first, and the second port, and a transmission control part, It has composition provided with a switching section which outputs data containing picture information inputted from either an inputted image interface, the first and the second port to the first or the second port according to a destination address to which it was added by the data concerned.

[0010]If it has such composition, since a transmission control part functions as a part of switching hub function, it can transmit picture information to an image output device, without occupying a network connected with a host computer via serial interface.

[0011]According to the invention according to claim 2, a switching section is considered as composition provided with a switching multiplexer which connects selectively said inputted image interface, said first, and the second port based on said destination address detected from data containing inputted picture information. If it has such composition, since a transmission control part functions as a part of switching hub function, it can transmit picture information to an image output device, without occupying a network connected with a host

computer via serial interface.

[0012]According to the invention according to claim 3, a switching section, A serial-parallel-conversion part which changes data which is provided to an inputted image interface, the first, and the second port, respectively, and contains inputted picture information into parallel data from serial data, and detects a destination address, It has composition provided with a switching multiplexer which connects serial-parallel-conversion parts selectively, and a control section which controls connection of a switching multiplexer based on a destination address detected in a serial-parallel-conversion part.

[0013]Thus, after changing serial data into parallel data, when the host computer is not operating by comparing an address and controlling connection of a switching multiplexer, a switching hub function can be exhibited.

[0014]According to the invention according to claim 4, a picture input device is used as an image scanner unit, and it has composition which made an image output device a printer. A copy function can be easily realized by this transmitting and outputting image data read with an image scanner unit to a printer via serial interface, without using a parallel interface.

[0015]According to the invention according to claim 5, a switching section, When a digital signal inputted from an inputted image interface is data containing copy data, When a digital signal which transmitted the copy data concerned to the first port, and was inputted from an inputted image interface is data containing scanner data, The scanner data concerned are transmitted to the second port, and when a digital signal inputted from the second port is data containing printer data, it has composition which transmits the printer data concerned to the first port.

[0016]if constituted in this way -- a function as a usual scanner -- in addition, a function as a copy machine can be realized and printer data transmitted from a computer can be further transmitted to a printer.

[0017]According to the invention according to claim 6, said picture input device is connected only to the first port, and when a switching section is data containing copy data inputted from an inputted image interface, it has composition which transmits the data concerned to the first port. A function as a copy machine can be realized easily, without being controlled by a host computer, if it has such composition.

[0018]According to the invention according to claim 7, the first and the second port are mutually made into the same structure, and it has composition which made a mutual connection object exchangeable. Since it is good also considering which as the first port among two ports for serial interface if it does in this way, it is decided [ whether an image output device is connected to the port, and ] whether the port will be the first port. A possibility that this may mistake a port which connects a picture input device and a network can be abolished.

[0019]According to the image information transmission system of this invention according to claim 8, the picture input device according to claim 1, An image output device connected to the first port via serial interface and a host computer connected to the second port via a network of serial interface constitute.

[0020]By constituting in this way, picture information can be transmitted to an image output device, without occupying a network connected with a host computer via serial interface.

[0021]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings. First, with reference to drawing 1, the embodiment of the image information transmission system of this invention is described. As shown in drawing 1, this image information transmission system is constituted by the image scanner unit 100 as a picture input device, the printer 101 as an image output device, and the host computer 102 and the computer 103.

[0022]The image scanner unit 100 is provided with the transmission control part 10 in order to realize a part of switching hub function inside a device. The first port 11 and the second port 12 are established in this transmission control part 10. The printer 101 is connected to the first port 11 via the serial interface 104. The host computer 102 is connected to the second port 12 via the network 105 of serial interface. This network 5 is good for LAN (Local Area Network), such as Ethernet (registered trademark) (Ethernet (registered trademark)), to constitute for example.

[0023]If it has such composition, since the transmission control part 10 functions as a part of switching hub function, it can transmit picture information to the printer 101, without occupying the network 105 connected with the host computer 102 via the serial interface 104.

[0024]Next, the composition of the image scanner unit 100 which contained the transmission control part 10 is explained with reference to drawing 2. As shown in drawing 2, the image scanner unit 100 is constituted by the P treating part 2, the C treating part 3 and the P treating part 4 which perform the image input element 1 and image processing other than the transmission control part 10, the engine part 5, MPU6, ROM7 and RAM8, and the distribution power board 9.

[0025]The engine part 5 Detection of covering opening and closing of the image reading part of the image scanner unit 100, It has the function to perform operation required for the image input elements 1, such as various kinds of sensors for detection etc. of the revolving speed of detection of the size of the paper for image reading, the motor to which a scanning section is moved, and its motor, to read picture information.

[0026]The image input element 1 is constituted by optoelectric transducers, such as CCD and CIS. And the picture information which the image input element 1 read is first sent to the P treating part 2. In the P treating part 2, to picture information, an A/D conversion is performed

and first stage processing which amends dispersion in the picture information by dispersion in the input characteristics of an image input element, dispersion of the light intensity of the light emitting device of a light source, etc. is performed. And in using picture information as copy data, it sends the picture information to which first stage processing was performed, for example to the C treating part 3. In using picture information as scanner data, it transmits the picture information to which first stage processing was performed, for example to the S treating part 4.

[0027]Copy data refers to the picture information transmitted to the printer 101 from the image scanner unit 100 here, in order to realize a copy function. The data containing copy data refers to the data relevant to the copy which contains the data for controlling a printer other than copy data, etc., for example. Scanner data refer to the picture information transmitted to the host computer 102 from the image scanner unit 100, in order to realize the scanner function as peripheral equipment. The data containing scanner data refers to the data relevant to a scanner including the information about a scanner, etc. besides scanner data, for example.

[0028]Whether it is used as scanner data whether picture information is used as copy data may point from the distribution power board 9, and it may point from the host computer 102 via the network 105, for example. The number of sheets of a read picture, image quality, concentration, expansion of a picture and reduction, and setting out of various kinds, such as paper selection, can also be performed besides the use of picture information from the distribution power board 9 or the host computer 102.

[0029]And in the C treating part 3, image processing for making the image quality as a copy of the edge detection of a picture, integration treatment, a differential process, zooming, rotation, error diffusion, etc. is performed, and copy data is generated. The generated copy data is once stored in RAM8. When stored in RAM8, data may once be compressed. The destination address which makes the printer 101 an address is added to the copy data stored in RAM8 by MPU6 as header information of a digital signal. This destination address is stored as a table of an IP address in ROM7. And the copy data in which the destination address was added is sent out via serial interface through the inputted image interface 13 and the transmission control part 10 to the printer 101 from the first port 11.

[0030]In the S treating part 4, quantization of picture information, file-izing, compression, etc. are processed, and scanner data are generated. The generated scanner data are once stored in RAM8 like the case of copy data. The destination address which makes the host computer 102 an address is added to the scanner data stored in RAM8 by MPU6 as header information of a digital signal. This destination address is also stored as a table of an IP address in ROM7. And the scanner data in which the destination address was added are sent out via serial interface through the inputted image interface 13 and the transmission control part 10 to the host computer 102 from the second port 12. The control section 14 may include this control



section 14 and the inputted image interface 13 in an image processing means, although connected to the image processing means (the C treating part 3 and the S treating part 4) via the inputted image interface 13.

[0031]Next, the composition of the transmission control unit 10 for realizing a switching hub function is explained with reference to drawing 3. The transmission control unit 10 is a device which controls the transmission state the inputted image interface 13, the first port 11, and between second port 12. Therefore, the transmission control unit 10 is provided with the switching block 15 as shown in drawing 3. It is connected to the inputted image interface 13 via the control section 14, and is connected to the first port 11 via the physical layer (PHY) 16, and this switching block 15 is connected to the second port 12 via the physical layer (PHY) 17. The physical layer may be further inserted between the control section 14 and the switching block 15.

[0032]And in order that the transmission control unit 10 may realize a switching hub function, With the switching block 15, a transmission route is changed according to the destination address to which the picture information inputted from either the inputted image interface 13, the first port 11 and the second port 12 was added by the picture information concerned, and it outputs to the first port 11 or the second port 12.

[0033]The data in which the picture information into which the switching block 15 was inputted from the inputted image interface 13 specifically contains copy data. (it is hereafter written as the copy data S1.) -- it is -- a case -- the copy data S1 -- the first -- it transmits to port 11 and sends out to the printer 101 which a destination address shows. In drawing 1 and drawing 3, the two-dot chain line shows the transmission route of the copy data S1 typically.

[0034]The data in which the picture information into which the switching block 15 was inputted from the inputted image interface 13 contains scanner data. (it is hereafter written as the scanner data S2.) -- it is -- a case -- the scanner data -- the second -- it transmits to port 12 and sends out to the host computer 102 which a destination address shows. In drawing 1 and drawing 3, a dashed dotted line shows the transmission route of the scanner data S2 typically,

[0035]When the data (it is hereafter written as the printer data S3.) which contains printer data from the second port 12 is inputted, the switching block 15 transmits the printer data to the first port 11, and sends it out to the printer 101 which a destination address shows. In drawing 1 and drawing 3, the dashed line shows the transmission route of the printer data S3 typically.

[0036]therefore, the image scanner unit 100 of this embodiment -- the function as a usual scanner -- in addition, the function as a copy machine can be realized and the printer data transmitted from the host computer 102 grade can also be further transmitted to the printer 101. Printer data refers to the picture information transmitted to the printer 101 via the image scanner unit 100 from the host computer 102. The data containing printer data refers to the data relevant to a printer including the control information on a printer other than printer data,

etc., for example. As shown in drawing 1, the course which transmits printer data to the printer 101 directly by IEEE 1284 from the host computer 102 may be established as a transmission route of printer data.

[0037]Next, the example of composition of the switching block 15 is explained with reference to drawing 4. As shown in drawing 4, the switching block 15, The serial-parallel-conversion parts (S/P) 51, 52, and 53 provided to the inputted image interface 13, the first port 11, and the second port 12, respectively, It is constituted by the switching multiplexer 54 which connects selectively these serial-parallel-conversion parts 51 and 52 and 53, the control section 55, a buffer memory and 56, MPU57, ROM58 and RAM59, and the MPU interface (MPUI/F) 60.

[0038]In the serial-parallel-conversion parts 51, 52, and 53, while changing various data, such as inputted picture information, into parallel data from serial data, the destination address added to the data concerned is detected. The detected destination address is sent to the control section 55.

[0039]A destination address is compared in the control section 55. Through the MPU bus and the MPU interface 60, the address of a comparison object is transmitted to the control section 55 by MPU57, and is held. RAM59 is provided as workspace of MPU57 and is.

[0040]And based on the comparison result of a destination address, connection of the switching multiplexer 54 is controlled by the control section 55. The destination address added to the data which specifically contains the picture information inputted into the serial-parallel-conversion part 52 from the inputted image interface 13, for example, When the IP address of the printer 101 is shown (i.e., when picture information is copy data), the switching multiplexer 54 connects the serial-parallel-conversion part 52 and the serial-parallel-conversion part 51. As a result, without occupying the network 105, copy data will be transmitted to the printer 101 via the serial interface 104 from the first port 11, as shown in drawing 1.

[0041]The destination address added to the picture information inputted into the serial-parallel-conversion part 52 from the inputted image interface 13, for example, When the IP address of the host computer 102 is shown (i.e., when picture information is scanner data), the switching multiplexer 54 connects the serial-parallel-conversion part 52 and the serial-parallel-conversion part 53. As a result, scanner data will be transmitted to the host computer 102 via the network 105 from the second port 12, as shown in drawing 1.

[0042]The destination address added to the picture information inputted into the serial-parallel-conversion part 53 from the second port 12, for example, When the IP address of the printer 101 is shown (i.e., when picture information is printer data), the switching multiplexer 54 connects the serial-parallel-conversion part 53 and the serial-parallel-conversion part 51. As a result, printer data will be transmitted to the host computer 102 via the network 105 from the first port 11. Therefore, as shown in drawing 1, the printer data sent out from the host computer 102 will be transmitted to the printer 101 from the image scanner unit 100.

[0043]Thus, after changing serial data into parallel data, when the host computer 102 is not operating by comparing an address and controlling connection of the switching multiplexer 54, a switching hub function can be exhibited.

[0044]In the embodiment mentioned above, although the example which constituted this invention from specific conditions was explained, this invention can make various change. For example, in the embodiment mentioned above, although the example of the image scanner was explained as a picture input device, by this invention, a picture input device is not limited to an image scanner. This invention can apply picture information, such as a digital camera, to the general information machines and equipment which can be incorporated as a digital signal, for example.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention]As mentioned above, as explained in detail, in this invention, the transmission control part which functions on a picture input device as a part of switching hub function was provided.

Therefore, picture information can be transmitted to an image output device, without occupying the network connected with the host computer via serial interface.

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CLAIMS

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[Claim(s)]

[Claim 1]An inputted image interface which is a picture input device and was connected to an image processing means inside the picture input device concerned, comprising, Have a transmission control part which controls a transmission state said first and between the second port, and said transmission control part, A picture input device provided with a switching section which outputs data containing picture information inputted from either said inputted image interface, said first and the second port to said first or the second port according to a destination address to which it was added by the data concerned.

The first port for serial interface connected to an image output device.

The second port for serial interface connected to a network or a host computer.

[Claim 2]The picture input device according to claim 1, wherein said switching section is provided with a switching multiplexer which connects selectively said inputted image interface, said first, and the second port based on said destination address detected from data containing inputted picture information.

[Claim 3]The picture input device comprising according to claim 1 or 2:

A serial-parallel-conversion part which changes data which said switching section is provided to said inputted image interface, said first, and the second port, respectively, and contains inputted picture information into parallel data from serial data, and detects said destination address.

A switching multiplexer which connects said serial-parallel-conversion parts selectively.

A control section which controls connection of said switching multiplexer based on said destination address detected in said serial-parallel-conversion part.

[Claim 4]The picture input device according to claim 1, 2, or 3 having used said picture input

device as an image scanner unit, and making said image output device into a printer.

[Claim 5]When a digital signal inputted from said inputted image interface is data containing copy data, a switching section, When a digital signal which transmitted the data concerned to said first port, and was inputted from said inputted image interface is data containing scanner data, The picture input device according to claim 4 transmitting the data concerned to said second port, and transmitting the data concerned to said first port when a digital signal inputted from said second port is data containing printer data.

[Claim 6]The picture input device according to claim 5 which said picture input device is connected only to said first port, and is characterized by transmitting the data concerned to said first port when a switching section is data containing copy data inputted from said inputted image interface.

[Claim 7]The picture input device according to any one of claims 1 to 6 having made said first and the second port into the same structure mutually, and making a mutual connection object exchangeable.

[Claim 8]An image information transmission system being constituted by the picture input device according to claim 1, an image output device connected to said first port via serial interface, and host computer connected to said second port via a network of serial interface.

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[Translation done.]